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NGV R&D Demonstration and Deployment Recommendations to DOE

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History of Natural Gas Recommendations to DOE

- Natural Gas Industry "RD&D" Initiative dates back to 1988
- Industry recommendations to DOE on all facets of natural gas development needs
  - Res, Comm., Ind., Power Gen, Cogen, NGVs, Fuel Cells, HVAC, Supply
- Deregulation/energy industry restructuring in late 1990's
  - De-emphasis of R&D at natural gas utilities
  - Breakdown of broad coalition of natural gas companies supporting R&D
- NGVs were one major area where industry has continued to supply input to DOE and Congress on RD&D recommendations
- Recommendations today are consistent with recommendations in the past – develop advanced NG technologies

Current DOE Request for NGVs

- Develop more HD engines to meet post 2010 EPA standards
  - Need OEM engines with displacements that round out the entire HD application portfolio of vehicle products
  - Field test theses engines
- Vehicle Integration
  - Design engineer new engines and fuel systems into breath of MD/HD products that are commercially available
  - Field test these new systems to gain customer confidence/acceptance
- Integration of NG engines with Hybrid MD/HD Vehicle platforms (NEW)
  - Includes electric as well as hydraulic hybrids

Current DOE Request for NGVs (cont.)

- Develop technologies to convert renewable sources of natural gas to vehicle fuel (NEW)
  - Landfill gas, waste water treatment facilities, animal/crop waste
- Support the improvement of aftermarket conversion systems to allow greater penetration of natural gas into consumer/fleet vehicles (NEW)
  - Address concerns of EPA and CARB regarding aftermarket systems
- Improve reliability, safety and efficiency of CNG, LNG, LCNG fueling infrastructure
- **Provide overall coordination of RD&D activities**
  - **Leadership of Natural Gas Vehicle Technology Forum**
  - Sponsorship of Codes and Standards activities that benefit all gaseous fuels

New Issues to Consider

- U.S. OEMs reconsidering production of NGVs
  - Don't have the financial capability to do this without assistance
  - Need federal encouragement/support
  - Response to changing energy and GHG policies
- Other world OEMs considering introduction of their NGV vehicles to the U.S.
  - Consumer oriented vehicles
  - Address petroleum reduction goals and GHG regulations
- Discussions with OEMs on synergies between natural gas and hydrogen deployment strategies

New Issues to Consider (cont.)

- California's aggressive position on GHG emissions and petroleum reduction
  - California Energy Commission AB118 funding ($120 million/yr) to address petroleum reduction and GHGs
    - Support R&D efforts for alternative fuels (including natural gas)
    - Support OEM support of introducing alternative fuels into Calif.
    - Support bringing NGV products to Calif. from other countries
  - California Air Resources Board
    - Focus on GHG emissions reductions
    - Low Carbon Fuel Standard – recognizes low carbon content of natural gas and even better benefits of renewable natural gas
    - Has own $85 million/yr fund to reduce GHGs

Conclusions

- **U.S. needs DOE's leadership in regard to NGVs**
  - **Natural Gas Vehicle Technology Forum**
  - **Collaborating with entities like CEC for product development/deployment**
- Natural gas can displace quantities of petroleum equal to or greater than some alternative fuel options
- **DOE role may change - similar to the $25 billion that Congress authorized for the OEMs**
  - Offer grants to engine/vehicle manufacturers in return for demands on bringing significant volumes of products to market
  - Allow multiple grants to an OEM for multiple engines/platforms
- NGVs can be huge success story for petroleum reduction and GHG reduction